Two uses of uncertainty analysis

1. To select among alternatives:

Example Uncertainty Matrix for Evaluating Probable Technologies

Probable Technology	Conditions Affecting Performance	Probable Range of Conditions	Threshold at Which Technology Becomes Undesirable	Means of Identifying When Threshold is Crossed	Alternative or Contingency
Hot spot removal followed by capping	Ability to locate hot spots safely	Conditions either allow or do not allow location of hot spots by geophysical (non-intrusive) methods	Hot spots can only be located by intrusive sampling that could release the hot spots or accelerate their migration	Determine nature of hot spots and their fingerprint compared to other matrix	Capping without hot spot removal
Capping without hot spot removal	Potential for intrusion that breaches cap under future land use	Institutional controls to unrestricted land use	Unrestricted residential or industrial land use	Reach stake-holder consensus on future land use	In-situ stabilization or exhumation
Exhumation followed by off-site storage and disposal	Volume of excavated media	Volume=0 to maximum volume of WAG	Volume of excavated media exceeds capacity of selected storage or disposal site	Maintain running inventory of excavated volume	Use alternate storage or disposal site with additional capacity
	Ability to meet waste acceptance criteria (WAC) of selected storage or disposal site	Excavated media either do or do not meet WAC of selected storage or disposal site	Excavated media do not meet WAC of selected storage or disposal site	Sample and analyze excavated media as required by WAC	Use alternate disposal or storage site

2. To implement a selected alternative:

Example Uncertainty Analysis for Evaluating Remedial Design/Implementation

Expected Condition	Reasonable Deviation	Evaluation			Monitoring Plan	Contingency Plan
		Probability of Occurrence	Time to Respond	Potential Impact		
Pu-238 contamination in the soil does not reach the existing sanitary sewer line under the north canal.	Contamination extends to within 5 feet of sewer lines requiring excavation of soil around sewer pipe, causing structural instability in the pipe.	Low. Existing information does not suggest contaminants have migrated to this depth.	Long. Excavation can move to other areas but deviation must eventually be resolved to prevent schedule delays.	Medium. Excavation cannot continue around the sewer line.	Screen selected samples 5 feet above sewer line using an on-site lab to determine if 25 pCi/g cleanup goal is met.	Reroute sewer or shore the pipeline; excavate in area adjacent to the pipeline until contingencies are implemented.